

10/52727

## PATENT COOPERATION TREATY

Rec'd PCT/PTO 09 MAR 2005

PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

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01 OCT 2004

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference CH920010071	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/IB 03/03834	International filing date (day/month/year) 28.08.2003	Priority date (day/month/year) 09.09.2002	
International Patent Classification (IPC) or national classification and IPC B41F1/00			
Applicant INTERNATIONAL BUSINESS MACHINES CORPORATION et Al.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a.  (*sent to the applicant and to the International Bureau*) a total of 5 sheets, as follows:

- sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
- sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b.  (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the opinion
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 20.03.2004	Date of completion of this report 04.10.2004
Name and mailing address of the international examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Bacon, A  Telephone No. +31 70 340-3291



# INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/IB 03/03834

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

### Description, Pages

1-26 as originally filed

### Claims, Numbers

1-41 received on 11.09.2004 with letter of 08.09.2004

### Drawings, Sheets

1/15-15/15 as originally filed

- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	
	No:	Claims	1-41
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-41
Industrial applicability (IA)	Yes:	Claims	1-41
	No:	Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

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International application No.

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**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: US-B1-6 180 239.
- D2: US-B1-6 399 295.
- D3: DE-A-3 225 483.
- D4: DE-A-3 201 065.
- D5: US-A1-2002/098 618.
- D6: US-A-4 539 747.

1. The present application still fails to meet the requirements of Article 33(2) PCT, because the subject-matter of Claims 1-41 is not novel with respect to prior art as defined in the Regulations (Rule 64 PCT). The reasons are as follows:

1.1 Document D1 describes a method for transferring a pattern from an elastic stamp to a substrate in the presence of a third medium (in this case air is the third medium), the method comprising the step of bringing the stamp into contact with the substrate while controlling the layer of the third medium (air) between the stamp and the substrate to a predetermined thickness (i.e. when the stamp is placed on the substrate to be printed the air layer has a predetermined thickness of zero), and guiding the excess air away from the surface of the stamp (this would appear to be inevitably the case when using a stamp) (see Claims 1 and 10-13; Figures 1, 5 and 9; column 1, lines 16-20; column 7, line 4 to column 8, line 65; column 10, line 66 to column 11, line 31; cf. present Claim 1).

Document D1 additionally discloses the use of the method of Claim 1 for the purposes listed in independent Claims 22-30 (see the passages mentioned in the preceding paragraph; these uses are also well-known in the art and described in the documents cited by the applicant in the present description).

Furthermore, document D1 describes a stamp (suitable) for transferring a pattern to a substrate in the presence of air as a third medium, the stamp comprising a contact surface and drainage channels formed in the contact surface suitable for guiding excess air away from the surface of the stamp (see Claims 1 and 10-13; Figures 1, 5

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and 9; column 1, lines 16-20; column 7, line 4 to column 8, line 65; column 10, line 66 to column 11, line 31; cf. present independent Claim 31).

In addition, document D1 describes a stamp (suitable) for transferring a pattern to a substrate in the presence of air as a third medium, the stamp comprising a permeable hydrophilic matrix suitable for guiding excess air away from the surface of the stamp (see Claims 1 and 10-13; Figures 1, 5 and 9; column 1, lines 16-20; column 7, line 4 to column 8, line 65; column 10, line 66 to column 11, line 31; cf. present independent Claim 37).

Claims 31 and 37 are still so broad as to be anticipated by any conventional rubber desk stamp. The recesses in the stamp being regarded as suitable for guiding excess third medium (ink, in the case of a desk stamp) away from the surface of the stamp.

1.2 Document D1 also, either explicitly or implicitly, discloses the subject-matter of the dependent Claims 2-21, 32-36 and 38-41 which relate to further embodiments of the subject-matter of independent Claim 1, 22-31 and 37 (see the passages mentioned above and cited in the International Search Report).

1.3 Document D2 similarly discloses the subject-matter of Claims 1-41 (see the passages cited in the International Search Report). Documents D3 and D4 disclose the subject-matter of Claims 1-26 and 29-41, whilst document D5 discloses the subject-matter of Claims 1-26 and 31-41. Document D6 describes the subject-matter of Claims 1-21, 24 and 31-41.

Therefore, the subject-matter of Claims 1-41 is not novel according to Article 33(2) PCT with respect to prior art as defined in the Regulations (Rule 64 PCT).

**Claims**

1. Method for transferring a pattern from an elastic stamp  
5 to a substrate in the presence of a third medium, the method  
comprising: bringing the stamp into contact with the substrate  
while controlling a layer of the third medium between the  
stamp and the substrate to a predetermined thickness, guiding  
excess third medium away from the surface of the stamp.

10

2. Method according to claim 1, wherein the substrate is  
rigid.

3. Method according to claim 1, wherein the substrate is  
15 impermeable.

4. Method according to claim 1, wherein the third medium  
comprises one or more of gas, water, solvent, polymer,  
emulsion, sol-gel precursor, and the like.

20

5. Method according to claim 1, wherein the controlling  
comprises avoiding trapping of the third medium via the stamp  
matrix being permeable to the third medium.

25 6. Method according to claim 1, wherein the controlling  
comprises allowing a nanometer sized gap in the stamp to get  
filled with the excess third medium.

7. Method according to claim 1, wherein the controlling  
30 comprises providing a patterned stamp surface having channels  
to drain the excess third medium.

8. Method according to claim 1, wherein the controlling  
comprises filling vias and recesses formed in the stamp with a  
35 component having an affinity for the third medium.

9. Method according to claim 8, wherein the component is hydrophilic.

10. Method according to claim 9, wherein the component  
5 comprises a gel.

11. Method according to claim 10, wherein the gel is swellable by the third medium.

10 12. Method according to claim 11, wherein the controlling comprises swelling the gel with the third medium to form protrusions in the stamp.

13. Method according to claim 1, wherein the controlling  
15 comprises providing an array of protrusions and recessed zones in the stamp.

14. Method according to claim 13, wherein the excess third medium is guided away from the surface of the stamp via  
20 the recessed zones.

15. Method according to claim 13, wherein the array comprises a micrometer-sized pattern subdivided into smaller structures.

25 16. Method according to claim 15, wherein the smaller structures are separated by smaller drainage channels.

17. Method according to claim 16, wherein the smaller drainage channels are connected to a network of larger  
30 drainage channels.

18. Method according to claim 1, wherein the excess third medium is trapped in a shallow lense-like pocket between the stamp and the surface of the substrate.

19. Method according to claim 1, wherein the controlling comprises trapping the excess third medium in a pocket between the stamp and the substrate.

5 20. Method according to claim 1, wherein the stamp comprises channels.

21. Method according to claim 20, wherein the channels define molecular sized gaps between the stamp and the substrate.

10 22. Use of the method according to any preceding claim for printing biological molecules on a surface.

23. Use of the method according to any of claims 1 to 21 for printing dyes on a surface.

15 24. Use of the method according to any of claims 1 to 21 for printing catalysts on a surface.

20 25. Use of the method according to any of claims 1 to 21 for printing acids or bases on a surface.

26. Use of the method according to any of claims 1 to 21 for printing of radical initiators on a surface.

25 27. Use of the method according to any of claims 1 to 21 for detection of molecules through proximity by fluorescence resonance transfer.

30 28. Use of the method according to any of claims 1 to 21 for purification and concentration of reactants.

29. Use of the method according to any of claims 1 to 21 in an offset printing process.

- 30 -

30. Use of the method according to any of claims 1 to 21 in a rolling contact process.

31. A stamp for transferring a pattern to a substrate in the presence of a third medium, the stamp comprising a contact surface and drainage channels formed in the contact surface for guiding excess third medium away from the surface of the stamp.

10 32. A stamp according to claim 31 wherein the surface is patterned.

33. A stamp of claim 31, wherein the stamp comprises an array of protrusions.

15 34. A stamp according to claim 32 wherein the patterning comprises a micrometer sized pattern subdivided into smaller structures.

20 35. A stamp according to claim 34, wherein the drainage channels extend between the smaller structures.

36. A stamp according to claim 31, wherein the drainage channels form a network.

25 37. A stamp for transferring a pattern to a substrate in the presence of a third medium, the stamp comprising a permeable hydrophilic matrix for guiding excess third medium away from the surface of the stamp.

38. A stamp according to claim 37, wherein the stamp comprises active vias.

39. A stamp according to claim 38, wherein the vias are filled with a material permeable by the third medium.

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40. A stamp according to claim 37, wherein the stamp comprises active recesses.

41. A stamp according to claim 40, wherein the recesses are  
5 filled with a material permeable by the third medium.